



State Route 18 - Maple Valley to Issaquah Hobart Road Compliance Investigation

WSDOT's is widening State Route 18 between Maple Valley to Issaquah Hobart Road to reduce congestion and enhance safety. This construction is part of an ongoing effort to upgrade State Route 18 into a four lane divided highway from Auburn to I-90. The Maple Valley to Issaquah Hobart Road project:

- widens three miles of State Route 18
- constructs a new interchange at 244th Avenue Southeast
- removes at-grade intersections at 236th Avenue Southeast, 244th Avenue Southeast, and Southeast 200th Street
- replaces existing bridges over State Route 169 and the Cedar River
- builds a new bridge over State Route 18 at Southeast 200th Street
- builds 49 acres of wetland mitigation sites

Wetland Mitigation Site 2, located in the southwest quadrant of the intersection of State Route 18 and 244th Avenue Southeast, is a twenty acre Class I wetland site with both riparian and upland buffer. To enhance this wetland, the mitigation plan requires placement of scattered material and brush piles throughout.

WSDOT and our contractor intended to use woody material cleared from elsewhere in the construction site to build these wetland enhancing features. As clearing and grubbing operations proceeded, the contractor stockpiled material in log holding yards as designated on the plan sheets in the following order:

- Trees were stored in open areas in the log holding yard located near 236th Street and Pond TC-4.
- As the open areas of this storage site filled, the second log holding yard was utilized (located near 200th Street). This site is future Mitigation Site 3. The site was mined and materials used for the roadway embankments.
- As Mitigation Site 3 was filled, standing trees located on the 236th Street holding yard site were removed and the open space was then utilized for additional storage. Additional storage also took place in future Mitigation Site 4, located in the northwest quadrant of the intersection of 244th Avenue Southeast and State Route 18 and 216th Place. Storage of materials in future Mitigation Sites 3 and 4 are not considered fill as both sites require extensive grading to create wetland per the wetland mitigation plan and project permits.

- Mitigation Site 1, located just east of Pond TC-4, was never utilized as it is covered with trees and removal would have increased an already difficult problem. Work in this area will not occur until Stage 3.

On December 22, 2003, WSDOT's contractor began storing woody material in Wetland Mitigation Site 2. Crews covered approximately one acre of reed canary grass wetland with woody material.

Two WSDOT landscape architects discovered the stockpiling in Wetland Mitigation Site 2 while returning from a meeting with project and contractor staff on March 29, 2004. On April 8, 2004, WSDOT staff reported the placement of unauthorized fill in Wetland Mitigation Site 2, a Section 404 environmental permit violation, to involved resource agencies, specifically the U.S. Army Corps of Engineers, King County, Washington State Department of Ecology, and Washington State Department of Fish and Wildlife.

About the investigation

In a memo dated April 10, 2004, Bill Vlcek and Megan White asked Patty Lynch, WSDOT Environmental Compliance Branch Manager; Martin Palmer, WSDOT Northwest Region Environmental Programs Manager; and Jim Spaid, WSDOT Roadway Construction Engineer to investigate potential permit violations. The team was to:

- Analyze environmental compliance processes and where and when they broke down
- Analyze decision making and where and when it broke down
- Recommend what is needed to strengthen the regional environmental compliance strategy and bring it into alignment with WSDOT's statewide compliance strategy

The scope of the investigation involves the environmental permit violation at Mitigation Site 2. This report is not intended to provide a project-wide review of other environmental activities. As reported by WSDOT's project office and the contractor, the investigation assumes that insufficient space existed to store the woody material recovered from the clearing operation. Verification of all the records to compare tree quantities removed against project scheduling and construction operations is beyond the scope of this investigation.

The investigators:

- Viewed the construction site
- Studied the contract plans and specifications (Appendix A, Plans and Specification References)
- Interviewed the people involved (Appendix B, Organization Charts)
- Reviewed all permits applicable to the violation (Appendix C, Permits)
- Inspector's Daily Reports (Appendix D)

The team interviewed WSDOT's Project Engineer, Assistant Project Engineer, Project Inspectors, the contractor's Project Manager, and two Equipment Operators who worked on the wetland stockpiling operation. The team also interviewed WSDOT environmental, landscape architecture, and design staff to gain perspective on events leading up to the environmental permit violation.

Personnel

Investigators obtained information from twenty people pivotal to events leading up to and following the storage of woody materials in Wetland Mitigation Area 2 of the SR 18 - Maple Valley to Issaquah Hobart Road project. Their names, primary duties, and supervisors are listed below. They provided information through interviews and e-mail. Office organization charts are included in Appendix B.

WSDOT Construction Office

Construction Office staff ensure that the contract is appropriately executed and are responsible for the project schedule and budget. They assure contract compliance largely by inspecting materials and the contractor's work and comparing this work to contract plans and provisions. They then make payments for appropriately executed work.

Dave Standahl, Project Engineer

Project Engineer until April 2004. His primary responsibility is to ensure his projects are constructed according to the plans, specials and standard specifications. He reports to Ed Conyers, Engineering Manager for the Snohomish-King Area in WSDOT's Northwest Region.

Paul Johnson, Project Engineer

Replaced Dave Standahl as Project Engineer in late April 2004. His primary responsibility is to ensure his projects are constructed according to the plans, specials and standard specifications. He reports to Ed Conyers.

Maheer Abed, Assistant Project Engineer

His primary responsibility is to assist the project engineer to ensure projects assigned to their office are constructed according to the plans, specials and standard specifications. He reported to Dave Standahl and now reports to Paul Johnson.

Dwain Bunch, Field Engineer

His main responsibility is to ensure the construction project progresses and the contractor is in compliance with the contract. Dwain supervises several project inspectors that oversee specific aspects of the construction project. He reports Maheer Abed.

Jack Bighorse, Project Inspector

Former Project Inspector for both mitigation work and permit compliance. Recently left WSDOT to work elsewhere. A key responsibility of his position was to ensure the contractor is in compliance with the environmental elements of the contract. He reported to Dwain Bunch.

WSDOT Design Office

Design Office staff complete plans, specifications and estimates for construction projects. These must be delivered within schedule, scope and budget. They also ensure all permits, authorizations, and approvals are secured.

Les DuBois, Design Squad Leader

Managed consultant work, including the Hydraulic Report, Stormwater Site Plan, Cedar River and Taylor Creek hydraulic flow models, and drainage plans, specifications and estimates for the hydraulic design. Managed environmental permitting and mitigation design processes. Coordinated with the Bridge and Structures Office in later project phases. Reported to Stacy Trussler, Assistant Project Engineer, and Gary McKee, Project Engineer.

Jim Illg, Design Engineer

Designed roadway, geometrics, and staging plans. Reported to Gary McKee, Project Engineer.

Atkinson Construction, contractor

Forrest Dill, Chief Estimator

Oversees the prime contractor's operations.

KLB Construction, subcontractor

Lisa Bond and Brian Stubbs, Equipment Operators

Moved material at Mitigation Site 2.

WSDOT Northwest Region Environmental Office

Environmental Office staff:

- ensure compliance with federal, state and local environmental laws
- study, analyze and make determinations as to the impacts of transportation facility construction
- secure the necessary permits and approvals from all resource agencies as well as federal, state and local jurisdictions

Katie Mesich, Permitting Specialist

She acquired the environmental permits for this project. She reports to Chris Runner, Northwest Region Senior Environmental Coordinator.

Ben Brown, Documentation Program Manager

Ensures all permits are acquired for WSDOT's Northwest Region projects. He reports to Martin Palmer, Northwest Region Environmental Programs Manager.

Gary Davis, Biology Program Manager

A key responsibility of his position is to determine projects' environmental effects and the appropriate level of mitigation. He reports to Martin Palmer.

WSDOT Northwest Region Landscape Architecture Office

Landscape Architecture Office staff manage the roadside, an integral part of the transportation system. They provide guidance through planning, design, construction and maintenance phases. They develop plans for wetland mitigation and enhancement sites, weed control, irrigation installation, plant material acceptance, planting, and plant establishment.

Deborah Peters, Linda Cooley and Alisa Sawich, Landscape Designers

They design roadside and environmental mitigation projects. They also provide assistance to assure construction quality on projects they designed. All report to Beth MacLaren, Landscape Development Specialist, and when assisting with construction work through John Bennett.

Dave Peterson, Assistant Landscape Architect

He helps manage the Northwest Region Landscape Architecture Office and reports to Sally Anderson, Northwest Region Principal Landscape Architect.

John Bennett, Landscape Implementation Specialist

He ensures that landscaping elements of projects are appropriately implemented during construction. He coordinates directly with construction project engineers to ensure that plans with landscape architecture design stamps are implemented correctly. He reports to Dave Peterson.

Sally Anderson, Principal Landscape Architect

She manages the Northwest Region Landscape Architecture Office and directs and oversees roadside aspects of projects. These include planning, design, construction and maintenance activities for visual, operational, environmental, and auxiliary functions of the roadside. She reports to Amir Rasaie, Assistant Regional Administrator for Northwest Region Programs and Services.

WSDOT Northwest Region Plans Review Office

Plans Review Office staff review all aspects of the plans, specifications, and estimates for various types of highway construction and maintenance projects. They check for bidability, conformance to current standards, and progress toward scheduled turn-in dates. They manage plans, specifications and estimates distribution, comments, and revisions and ensure responses to all issues. They assemble headquarters and regionally-advertised contract documents and addenda for printing and distribution.

Joe Long, Plan Reviewer

He coordinates plans review and ensures that the plans, specifications and estimates meet agency standards and are properly packaged for advertisement. He reports to Don Wills, Northwest Region Plan Review Engineer.

Chronology of events

A more detailed chronology of events can be found in Appendix E.

2003

May 12: State Route 18 - Maple Valley to Issaquah Hobart Road contract advertised.

July 30: Bids opened.

August 15: Contract awarded to Atkinson Construction.

August 28: Environmental pre-construction meeting held. Landscape Architect Deborah Peters stated she informed the project office of available stockpile sites at Mitigation Site 1, 3, and 4 at the meeting (investigation team interview, April 19, 2004). Meeting minutes (Appendix F) contained no record of material storage discussion.

September 2: Contract executed.

September 9: Project preconstruction meeting. Meeting minutes (Appendix F) contained no record of material storage discussion.

December 19: Project Engineer Dave Standahl asked WSDOT design and landscape architecture staff questions regarding mitigation site sequencing requirements. He specifically sought guidance on what he should consider when allowing the contractor to adjust the sequence of work. Jim Illg sent an e-mail reply to Dave Standahl stating, "From my recollection, the only real reasons were to distribute the contractor's workload and to provide excavated material for roadway embankments when needed. Like you say, additional area for log holding yards may be another good reason. You should check the permit conditions to see if there is anything in them regarding this issue. I do believe there was some concern that the mitigation sites be constructed as soon as possible and not wait until the last stage to verify establishment/success of the site before the contractor leaves."

December 22: WSDOT's Northwest Region Landscape Architecture Office provided information about staging considerations in an e-mail that included six points. The construction project office interpreted this information as "direction." One statement mentioned that materials could be stored at Mitigation Site 2. When the project office received the e-mail they began storing materials at Mitigation Site 2. They continued to use the site for storage as clearing proceeded.

Dave Standahl stated that the December 22 e-mail did not have a bearing on his decision to place woody debris in Mitigation Site 2. He stated that the decision was made to construct brush piles and scatter wood on site based on Jim Illg's December 19 e-mail and the lack of response from Katie Mesich. Dave stated that he reviewed the plans, permits, and specifications and concluded that work required at Mitigation Site 2 was similar to work on a previous project where a portion of a wetland was entirely reconstructed. Dwain Bunch was Chief Inspector on that site as well. Dave assumed Dwain had completed all necessary communication with landscape architecture staff for work in Mitigation Site 2. Dave was not involved in discussions about how the work in Mitigation Site 2 was to be done (Dave Standahl comments on draft report, May 6, 2004).

Maher Abed, Dwain Bunch, and Jack Bighorse indicated they assumed Mitigation Site 2 was available for woody material storage based on the December 22 e-mail (investigation team interview, April 21, 2004).

2004

February 23 and March 9: Meetings to discuss lingering questions, including questions about materials storage. Adequate storage of materials was a question that was never fully resolved in design. There were pressures to meet the project advertisement date, so these questions carried over into construction. The construction project office was searching for additional storage space as the contractor pressured them for guidance. Other concerns revolved around the accuracy of the tree counts and the requirement to retain all wood on site. There was a substantial amount of e-mail correspondence taking place during this period between WSDOT's Landscape Architecture Office, Construction Project Office and Atkinson Construction. The correspondence failed to resolve the questions.

March 22: Last documented delivery of materials to Mitigation Site 2.

March 29: Meeting to discuss lingering questions, including questions about materials storage. Alisa Sawich and Deborah Peters told the contractor they could dispose of excess wood material off site. As a result of project office comments made at the meeting, Alisa and Deborah were concerned that material had been stored in Mitigation Site 2. They drove past the site on their return trip to their offices in WSDOT's Northwest Region Headquarters and confirmed that material had been placed at the site.

March 31: Alisa and Deborah notified their supervisor, Dave Peterson, of what they saw on March 29, 2004.

April 1: Dave Peterson contacted Northwest Region environmental staff.

April 2: Northwest Region environmental staff contacted the project office, conducted a site visit and alerted their management.

April 3 through April 7: Environmental staff continued to work with project office staff to clarify that a violation had occurred. Environmental staff were on site April 5, 6, and 7 to continue to assess the extent of the violation and work with project office staff to clarify compliance conditions.

April 5: WSDOT Northwest Region environmental staff notified WSDOT Headquarters Environmental Services Office.

April 8: WSDOT Northwest Region environmental staff discussed the situation with the U.S. Army Corps of Engineers. Written notice of the violation sent to the U.S. Army Corps of Engineers, Department of Ecology, King County, and State Department of Fish and Wildlife on the same day.

April 19: The U.S. Army Corps of Engineers issues a letter of violation to WSDOT.

Findings of fact

Internal communication problems

The detailed chronology of events (Appendix E) contains over three months of documented communication between construction, contractor, design, landscape architecture and environmental staff. Storage capacity questions emerged early in design and were left unresolved as the project moved into construction. Concerns about adequate storage capacity for woody materials resurfaced quickly as construction started.

The Project Engineer asked Design Office staff about issues to consider if he were to approve changes to mitigation sequencing outlined in the contract. Design staff responded that sequencing was suggested to distribute the contractor's workload and to provide necessary embankment materials for road construction. Design staff also noted that log holding yard capacity may also be affected if sequencing were adjusted.

The Project Engineer then asked landscape architecture and environmental staff the same question. Environmental staff provided no response, partly because they deferred early input to landscape architecture staff and partly because they felt they were to concentrate on permitting new projects. In most cases environmental staff were unaware of ongoing discussions regarding materials storage.

Landscape architecture staff provided responses they thought were limited to their responsibilities as the mitigation designer. The Project Office interpreted landscape architecture responses as direction on broader issues beyond the authority of landscape architecture staff, including appropriate woody material storage locations. In other circumstances, landscape architecture provided answers to project office questions without realizing the implications of their responses, for example, the reasons and affects of restrictions on exporting excess woody materials offsite.

Two key miscommunications follow:

Placement of material in Mitigation Site 2

Landscape architecture staff provided responses to questions regarding staging (timing of mitigation work). Project Office staff interpreted these responses as direction for acceptable storage locations, one of which was the use of Mitigation Site 2; they understood this correspondence to mean that storage of the woody material in Mitigation Site 2 was allowed. This communication was a critical contributing factor leading to the storage of material in Mitigation Site 2. The date of the correspondence coincides with the first inspector daily report describing import of material to Mitigation Site 2.

Export restrictions on woody materials

A critical discussion centered around whether the specials and permits intended that we retain all trees removed on site or that all trees used in the enhancement work must come from on-site. During permit negotiations WSDOT understood that resource agencies would like us to retain all trees used on site, to use all trees removed from the clearing operation in the enhancement efforts. WSDOT agreed to these conditions and used them as a selling point to obtain permits. However, the permits did not ultimately contain requirements to retain all wood on site. The contract's special provisions require the contractor to retain all materials and store them in the designated log holding yards shown on a vicinity map (see also special provisions, "Disposal of Usable Material and Debris", page 259).

The intent of this requirement was later questioned during construction as the storage problem escalated. Based on tree counts completed by biologists during design, landscape architecture staff thought they had designed mitigation features to the prescribed amount leaving no extra trees for export. It became apparent during construction that there were more trees to be removed than estimated in design. This realization sparked much of the documented correspondence about tree counts and raised questions about what to do with the extra trees. Clarification that we really just needed to keep enough trees to fulfill material requirements for the mitigation work was not confirmed until March 29, 2004, more than three months after materials were first placed in Mitigation Site 2.

Assumptions, misinterpreted terminology and faulty logic

Constructability problems identified but repeatedly left unresolved

Environmental mitigation constructability problems were first identified during 90 percent design review. Staff repeatedly noticed and commented on these problems as the project moved into construction, yet the issues remained unresolved. Finally, as construction moved forward and the contractor accelerated the project schedule, the need to resolve the issues became urgent. Facing these pressures, Construction Office staff used incomplete and inaccurate information to address constructability problems and, finally, allow crews to place material in Mitigation Site 2.

Stockpiling, storage and staging

King County permit condition 5115 states “stockpile and staging areas shall not be located within sensitive areas or their buffers.” The project office misinterpreted landscape architecture staff’s December 22, 2004, communication as approval to *store* materials in Mitigation Site 2.

Stockpiling was assumed to mean storage of material for use throughout the project site (multiple locations). The project office was operating under the assumption that they were not *stockpiling* material in Mitigation Site 2 because all material placed in the mitigation site would be used in the mitigation site. Thus Mitigation Site 2 was not serving as a *stockpile* location for other areas on the project. With one exception, everyone interviewed stated it was their understanding that all materials being delivered to Mitigation Site 2 were to be used in Mitigation Site 2. Project Inspector Jack Bighorse was the only person to state that he understood some of the materials were to be used in mitigation sites other than Mitigation Site 2 (see Appendix E, e-mail correspondence dated April 2, 2004).

The Project Office did not interpret *storage* of Mitigation Site 2 materials as a conflict with the special provisions (page 259), as the special provisions direct the placement of materials for *stockpiling*.

The Project Office operated under the assumption that *staging* addressed staging of equipment, not *storage* of woody materials for construction of the brush piles and habitat features of that site’s mitigation plan. The special provisions state that staging areas shall not encroach upon wetlands, streams, or their respective buffers (see staging area requirements in special provisions, page 213). The special provisions also require the contractor to submit a staging plan ten working days before use. Required elements in the staging plan address issues typically associated with equipment storage.

The Project Office was operating under the assumption that the special provisions allowed storage of the materials at Site 2 because it directed the contractor to move woody material from *staging area stockpiles* to Mitigation Site 2 for construction of the brush piles as designated on the plan sheets (See also special provisions, “compost brush piles”, page 404). The special provisions included neither a means nor method for moving materials out onto the site for brush pile construction. So the Project Office assumed it was acceptable to store the materials in any manner as long as all materials stored at the site were for exclusive use at the site and they protected desirable vegetation. They assumed that there was no problem with the manner of storage since the plans called for a substantial amount of construction work with the woody debris materials and no direction was given regarding the intended methods for moving those materials throughout the site. WSDOT and the contractor were relying on the mitigation subcontractor (Terra Dynamics) to provide details when work to build the mitigation site begins in approximately eight months.

Traditional methods and equipment assumed

Both the special provisions and the permits lack information about a specific way the mitigation work was to be accomplished. Thus, in practical terms, the permits prohibit traditional construction methods such as the creation of access roads for placement of brush piles. The requirement for use of non-traditional construction methods, like using a helicopter for overhead placement of materials, was likewise absent from the contract documents. This absence led the contractor to assume they could use traditional methods and equipment.

Grading restrictions interpretation

The Project Office and the contractor clearly understood grading restrictions for the site as covered in the contract and permits. However they needed to push material into Mitigation Site 2 to allow additional storage room as more material arrived over a three-month period.

To avoid grading while still pushing material into the site, bulldozer operators were instructed to keep the blade of the dozer raised so that the surface of the wetland was not disturbed.

Fence requirements—construction activity area or sensitive area?

Construction fencing is required as a first order of work in the contract (special provisions, page 237). Fencing is intended to protect sensitive areas from construction activities. The contractor worked with the Project Office to protect areas adjacent to active construction. Both parties deemed that fencing the entire project area would not provide additional protection to resources and would create a maintenance problem. It was the consensus of the people we interviewed that fencing was not installed around Mitigation Area 2 because it was considered a legitimate construction activity area, not a sensitive area.

Fencing requirements shown on the plan sheets differed from areas identified by resource agencies during post-event site reviews. Resource agency staff were not contacted to review fencing delineations provided in contract plans nor were they consulted to verify fencing occurred in all appropriate areas during construction. The following permits require resource agency fencing approval and verification:

- King County Grading Permit, specifically states that the appropriateness of fencing and location shall be approved and verified by a King County representative prior to commencement of any clearing, grading, or construction activities within Shoreline jurisdiction (Sections 5005 and 2014)
- King County Shoreline Management Permit (Condition #13)
- Department of Ecology Water Quality Certification (5a3b)

Notification and oversight requirements—when does work begin?

Some permits require resource agency notification before work in environmentally sensitive areas can begin. These include:

- Department of Ecology Water Quality Certification, requires notification to the Department of Ecology at least 10 days prior to starting construction work in wetlands, streams, or mitigation sites (Water Quality Certification Condition 3.a.3.)
- Department of Fish and Wildlife Hydraulics Project Approval, requires notification to the Area Habitat Biologist at least three working days prior to start of work for each significant project component involving a stream or wetland (Provision #2)

Permits also require oversight by qualified scientists when crews are working in environmentally sensitive areas:

- Department of Fish and Wildlife Hydraulics Project Approval, requires the presence of a biologist or ecologist on site, (Provision #49)
- King County Grading Permit, states qualified biologist or ecologist shall supervise the installation of compensatory mitigation measures (Sections 3002 and 3008)

The Project Office did not provide notification or request resource agency oversight before placing material in Mitigation Site 2 as they did not view storage of materials in the site as “starting construction work.” The contractor stated they consider the start of construction work to occur when construction of the enhancement features takes place early next year.

Comments regarding contract means and methods at 90 percent design were not addressed and resolved

During the 90 percent design review the construction office asked about work in the wetland sites. They asked, “Do we need to include specific requirements for the work in the area like metal sheets for access road, no tracked or wheeled vehicles, certain times of the season that the contractor can’t work?” The response to the questions was “Yes, we need to include steel plates for access.” However, no provisions describing the parameters for work in the wetland areas were included, even though there was a substantial amount of enhancement work required at Mitigation Site 2.

Use of unsuitable woody debris and separation of woody debris and fine materials

The contractor and project inspectors noted that material to be placed in Mitigation Site 2 was unprocessed woody material from the clearing and grubbing operation (special provisions p. 397). Space to store this material, which would eventually be used to construct brush piles and wood scattered through Mitigation Site 2, was constrained. The contractor asked permission to store these materials on the reed canary grass portion of the wetland.

However, material placed in Mitigation Site 2 did not meet contract specifications for brush piles. Special provisions require all wood to be scattered on site prepared to plan specifications before it is moved from stockpiles to the mitigation sites (special provisions, page 407). The contract requires brush piles constructed without incorporation of rock and soil (special provisions, page 403). Material placed in Mitigation Site 2 included mixed material from clearing operations, including rock, soil, logs, and root wads.

The method used to move the material caused segregation between the larger pieces and accompanying dirt and other fine material. Dozer operators, instructed not to disturb the surface of the wetland, dumped material at the edge of 244th Avenue Southeast and then pushed it out over the wetland. As a result, soil from root wads and fine matter from woody debris accumulated where the material was first dropped off the truck while the larger material was carried out in front of the dozer blade. Project staff still considered this material unprocessed. (Appendix G, Photos)

In addition, the investigative team found the following factors which would not have prevented the violations but should be addressed to make environmental requirements clearer:

Environmental requirements were not incorporated into contract provisions

As with all projects, staff are expected to meet the scheduled project advertisement date. Permits for this project arrived late. As a result, the project was advertised before permits were in hand.

There was substantial concern that permit conditions would be missed if WSDOT attempted a late revision of the special provisions to include permit conditions. Instead, permits were simply incorporated into the contract documents as an appendix. In turn, the special provisions required the contractor to comply with all permit requirements. The Construction Office received the U.S. Army Corps of Engineers permit a week before bid opening. The contract provisions stated that a “copy of the permit is available at the Engineer’s Office. The Contractor shall, at no expense to the Contracting Agency, comply with all requirements of the Corps of Engineers in the construction of the project.” Although there seemed to be few conflicts between the contract plans, provisions and permit requirements, this manner of presentation and reliance on other agencies to essentially write contract provisions related to environmental requirements provided neither clear instructions to the contractor nor the contract administrator on what work is to be done, the quality of work, and a clear method for measurement and payment.

WSDOT's standard contract allows work in wetlands without an approved roadside work plan

WSDOT's standard contracts technically allow contractors to do certain types of work in wetlands without an approved roadside work plan.

The Standard Specifications require the contractor to submit a roadside work plan for approval prior to starting any work on roadside restoration. Roadside restoration includes activities associated with planting and irrigation systems as described in Sections 8-02 and 8-03 of the Standard Specifications. The special provisions stipulate that the contractor should include a number of items (e.g., timing of work, equipment to be used, location of staging areas, etc.) as a separate section of the roadside work plan for work within wetland and mitigation sites (see Appendix A, special provisions, page 388).

However, since the required work plan items only apply to elements covered under the roadside plan, meaning planting and irrigation systems, and not *all* work associated with wetland mitigation sites, the contractor did not submit the plan prior to storing woody materials in Mitigation Site 2. According to the contractor, a subcontractor would be doing the construction in the wetland and they would prepare the roadside work plan prior to any planting and irrigation work at the site.

Conclusions

The need for storage was the key factor in placement of material in Wetland Mitigation Area 2. This storage was needed due to underestimation of the quantity of woody material produced by the clearing operation and confusion regarding the requirement to retain all wood on site

A lack of a means and method to perform the enhancement work in the final contract documents was one of several oversights. Also left unresolved were concerns related to tree count accuracy and sufficient material storage space.

A lack of a complete and accurate response to the contractor's storage needs heightened urgency. This contributed to the contractor and the Project Office mobilizing operations without a complete and thorough permit conditions review.

A lack of meaningful, dedicated involvement from all appropriate parties led to incomplete answers to Project Office questions.

E-mail language contributed to miscommunications in the form of perceived authorization to store woody material in Mitigation Site 2.

The Construction Office did not enforce notification, oversight and fencing requirements.

Timing and sequencing of work appears to have played a role in determining how much material had to be stored and what areas were available for storage. Sequencing might have reduced the need for extensive stockpile areas. More research is needed to evaluate its overall effect as well as how this could be balanced against other important aspects such as cost, schedule, and the availability of people and equipment.

The lack of definitions for terms not normally used in highway construction added to the confusion. Words such as *unprocessed* led the project office and the contractor to believe that the stone and soil trapped in the roots of the trees brought to Wetland Mitigation Area 2 should remain in place. Transport and subsequent movement at the site dislodged this material. This and the manner in which the material was spread at the site lent to the misimpression that the contractor purposely imported dirt. Another example is in the placement of construction fence around sensitive areas to be protected from construction activities. The contractor and Project Office felt that enhancement was a construction activity. Hence, they did not fence the mitigation area planned for enhancement.

The lack of a way to do the work in compliance with regulations in the special provisions and permits was a contributing factor. This led the contractor and Project Office to believe traditional highway construction methods such as pushing the woody material out onto the wetland were allowed for the enhancement work.

Urgent storage needs tended to override seemingly more distant concerns like related work methods to carry out enhancement work. The lack of a work plan prior to any work in sensitive areas contributed to the event. The Standard Specifications limit application of the Roadside Work Plan to planting and irrigation work. Had the required Roadside Work Plan items stipulated in the special provisions applied to all work in wetland mitigation sites, and had submittal and approval of the plan been required prior to any work within wetland mitigation sites, this violation may have been prevented.

Recommendations

Bring together the right people to solve problems

We recommend the Northwest Region extend WSDOT's managing project delivery initiative into construction. The initiative is a multidisciplinary approach that advocates bringing together the right people with the right expertise to solve problems.

We believe this approach would have properly directed the Construction Office to the right people when seeking help with the storage problem and properly engaged support staff regarding storage locations.

Establish Environmental Technical Advisors

The region should establish a unit within the environmental organization to serve as technical advisors to the construction engineering staff. The technical advisory group should consist of personnel that are knowledgeable in environmental requirements and able to advise on construction practices which are compliant with environmental regulations and permit conditions. This group would be available to work with Design and Construction Offices to provide a constructability review of mitigation projects, to visit project sites on a regular basis and to provide rapid response to permit requirement questions.

Separate compliance roles and responsibilities from project delivery roles and responsibilities

For each project Construction Office's currently designate a staff member to lead environmental compliance efforts. For projects with substantial environmental risk an independent environmental compliance officer should be assigned. The environmental compliance officer should not report to the Construction Office. The Environmental Technical Advisor should serve as a resource to help field inspectors and environmental compliance officers understand and apply regulatory requirements.

Fence all sensitive areas and enhance plan sheets

Fence all environmentally sensitive areas. Enhance plan sheets to clearly delineate sensitive areas, fencing requirements and permit conditions. Project staff should contact WSDOT's Environmental Technical Advisors with any questions about fencing locations. Include permit conditions or a requirement to contact Environmental Technical Advisors before working in the sensitive areas as designated on the plan sheets.

Develop proven and acceptable methods for work in streams and wetlands

We recommend WSDOT develop allowable practices for work in wetlands and streams to provide guidance to designers, project inspectors and contractors. Clear guidelines are needed to differentiate work methods used in sensitive areas from those customarily used for road and bridge construction. Environmental permits are typically written to allow a certain type of activity that would otherwise not be allowed. Construction contracts and industry standards are more focused on defining a quality standard or desired outcome, allowing flexibility in the means and methods that are at the contractors disposal.

Currently, permits are developed, and plans and specifications created for each project as a unique operation. While each project is unique in many respects, there are common elements that can be developed into general special provisions to develop consistency among projects and with resource agencies.

The development of these allowable practices and general special provisions should be done through an interdisciplinary approach involving WSDOT Headquarters Construction, Headquarters Environmental Services Office, corresponding region staff, industry representatives and members of resource agencies. The allowable practices and specifications thus developed will be the basis of training outlined previously.

A secondary recommendation is that all permit requirements that apply to the construction work be included in the plans and special provisions rather than included by reference or as an appendix in the contract. The permits represent WSDOT's contract with resource agencies and outline a wide spectrum of requirements that deal with design issues, construction, monitoring and maintenance. The plans and special provisions must clearly depict how the contractor is to do the work and how the project office will measure and pay for the work.

Revise standard specifications

Assure that all Roadside Work Plans address all work within sensitive areas

We recommend that WSDOT modify Standard Specifications to assure that Roadside Work Plan requirements address all work within sensitive areas. Currently, the Standard Specifications only require the contractor to submit a Roadside Work Plan for approval prior to starting any roadside restoration and irrigation work (Sections 8-02 and 8-03 Standard Specifications).

We also recommend that when wetland and stream mitigation are proposed in a contract, the special provisions and plan sheets note that no activity will be allowed in the wetland or stream until the Roadside Work Plan is approved. We recommend that the plan be required to address such items such as location of staging areas, access routes to construction areas, equipment use, and special techniques to minimize soil displacement and compaction by construction activities.

Provide advance notice to resource agencies before work in sensitive areas commences

Special provisions should include requirements that clearly require contractors and WSDOT staff to provide advance notice to resource agencies before work in environmentally sensitive areas begins.

Contractors must provide adequate advance notice of work in environmentally sensitive areas to Project Engineers. The amount of advance notice specified must be consistent with permit requirements and must allow adequate time for project staff to notify regulatory agencies.

Project offices must then provide advance notification of work in environmentally sensitive areas to both the Regional Environmental Office and regulatory agencies as required in permits.

Improve working relationships with regulatory agency staff

We recommend Project Engineers establish strong, cooperative relationships with environmental and resource agency staff and that they work through Environmental Technical Advisors to engage resource agencies in a technical assistance role throughout construction. This will reduce the risk of reporting and notification oversights and foster clarification of regulatory conditions.

Establish a consistent naming convention to identify sensitive areas

We recommend the use of consistent naming conventions to identify sensitive areas throughout the project delivery process. Differences between names used in reports supporting the design and permitting process and those referenced in final plan sheets are confusing and increase the risk of errors that can lead to environmental permit violations. While naming conventions did not directly contribute to the violation in Mitigation Site 2, the investigation team recognizes risk is increased when personnel are required to correlate various names for a single wetland site among documents.

Improve environmental training for project inspection staff and contractors

We recommend enhanced training for Project Inspectors. Project Inspectors already receive training to learn to identify wetlands. This enhanced training should focus on means and methods of working in the wetlands. For the incident at Mitigation Site 2 there was no doubt that the area being used to stockpile the material was a wetland. This was clear as staff expressed concern that equipment used to stockpile materials not disturb the wetland and that silt fences be installed before placement of material in the site (See Appendix D, December 22, March 12, March 15 Inspector's Daily Report records). Neither the contractor nor the Project Office understood the difference between storing material at the site and the regulatory limits of acceptable construction methods to completing the mitigation design.

We suggest the erosion control certification training program as a model. Training should be available at least annually, with certification required for environmental inspectors and a corresponding person on the contractor staff.

About the regional environmental permit compliance plan

WSDOT's statewide environmental permit compliance strategy instructs regions to develop plans specific to their geographic areas. Here are the key elements of the Northwest Region environmental permit compliance plan:

Northwest Region Environmental Office roles and responsibilities

- Provide contact information for environmental assistance, which is available at all times
- Deliver presentations and provide discussions at Project Engineer and Engineering Manager meetings to address environmental issues, foster awareness, and resolve challenges
- Provide direct access to permit, biology and water quality staff for permit assistance and clarification
- Stress use of existing instructional letters and directives (e.g., water quality monitoring and permit compliance assurance procedures)
- Issue a comprehensive environmental package to construction offices including permits and conditions, sensitive area maps, and environmental commitments list

Project Office roles and responsibilities

- Assure that projects are built according to plans and specifications, including environmental permits
- Invite resource agencies to pre-construction meetings for projects with substantial environmental issues
- Hold additional pre-construction meetings solely for projects with significant environmental issues
- Assign an environmental project inspector for projects with potentially substantial environmental impacts

Recommendations listed in this report, if implemented, will strengthen the regional compliance plan.